ARUMUGAM PILLAI SEETHAI AMMAL COLLEGE

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Tiruppattur – 630 211.

M.Sc., Mathematics Programme

Programme Outcome (POs) :

- PO-1. Help the students to enhance their knowledge in soft skills and Computing skills.
- PO-2. Enable the students to equip knowledge in various concepts involved in algebra, differential equations and graph theory.
- PO-3. Enable the students to acquire knowledge in C programming.
- PO-4. Students are trained in an effective manner to attend the competitive exams in order to brighten their future.
- PO-5. Facilitate students to acquire a flair knowledge in discrete mathematics, real analysis and solve problems efficiently.

Programme Specific Outcome (PPOs):

- PSO-1. To provide the student with pertinent information in the field of Mathematics.
- PSO-2.To teach the student with a broad understanding of Mathematical and their interactions with the Equations.
- PSO-3.To learn to apply mathematics to real life situations and help in problem solving
- PSO-4.The students will learn functions of real and complex variables, different types of integration.
- PSO-5. The students can solve various constrained and unconstrained problems in single variable as well as multivariable.
- PSO-6. Also by the understanding of Numerical Analysis they will ready to develop computational skill to solve science and engineering problems

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M.Sc., Mathematics Programme

Algebra I- 7MMA1C1

Course Description:

This course will cover the topics contained in the five syllabus. Several additional topics will also be covered and the presentation will not necessarily follow the text. Attendance is required and the exams will be over the lectures and homework. The course topics include:

- Group theory, subgroups, homomorphism, permutation group.
- Another counting principle.
- Ring theory.
- Ideals and Quotient rings.
- Enclidean rings, Polynomials over the rational field.

Course Objectives

- Including group, ring, field, homomorphism, automorphism, quotient structure and to apply some of these concepts to real world problems.
- Use results from binary operations, and its properties, definition of a group, subgroups, homomorphism, cayley's theorem, permutation groups, to solve contempotary problems.
- Explain from elementary principle, sylow's theorem why certain algebraic facts are true.
- Ring theory ,definition, examples of rings.
- Ideals and Quotient ring, more ideals and quotient rings, integral domain.
- Enclidean rings, prime ideal, maximal ideal prime avoidance theorem, polynomial rings over commutative rings.

Course Outcome (COs)

- Use sylow's theorem to describe the structure of certain finite groups.
- Explain the notation of extention field.
- Give the definition of concepts related to group, homomorphism, ring, ideals and field.
- Understand the structure of fields do computations in specific examples of finite fields.
- Understand the congrurence modulo concept, fermat's theorem.
- Use the concept of decomposition of composite number as a product of primes uniquely and euler functions.

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M.Sc., Mathematics Programme

ANALYSIS-I -(7MMA1C2)

Course Description: This course covers Basic Topology, Numerical Sequences and Series, Power Series, Continuity, Differentiation. COURSE OBJ

Course Objectives

- To apply Basic Topology on Metric Space, Compact Sets, Perfect Sets, connected Set.
- Acquired Knowledge on Convergent Sequences, Sub Sequences, Cauchy Sequences, Upper and Lower Limits, Special Sequences.
- Distinguish of Continuity and Compactness.
- Acquired Knowledge Continuity, Discontinuity, Monotonic Function.

Course Outcome (COs)

On complete of this course

- To know the Basic of Analysis.
- To learn the different types of Numerical Sequences and Series.
- Understand the Bounded, Convergences, Divergence Definetion.
- Understand and perform simple derivative of a Real Function.
- Prove a theorem Mean Value Theorems, Taylor's Theorems, Differentiation of Vector-Valued Function.

Differential geometry - 7MMA1C3

Course Description:

This course will cover the topics contained in the five syllabus. Several additional topics will also be covered and the presentation will not necessarily follow the text. Attendance is required and the exams will be over the lectures and homework. The course topics include:

- Arc length, serret - frenet formulae
- Osculating circle. • Surfaces and class of surfaces.
- Geodesics and geodesic curvature

Course Objectives

The objectives of this subject is to expose student to understand several important concepts in Differential Geometry.

- Arc length and tangent,normal Binormal to apply some of these concepts to real world problems.
- Use results from geodesics curvature, and its properties, definition of a osculating sphere, intrinsic equations.
- Explain from serret_frenet formulae isometric correspondents.
- Canonical geodesics equations ,definition, examples .
- Direction coefficients and family of curves.
- Fundamental form of principal curvature,line curvature and developables.

Course Outcome (COs)

Students will able to:

- Use gauss bonnet theorem to describe the second fundamental form and developables.
- Explain the geodesics parallels.
- Give the definition of concepts related to normal propertyof geodesics.

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M.Sc., Mathematics Programme

Differential Equation - 7MMA1C4

Course Objectives

This course intended to expose you to the basic ideas of Differential equation. In particular to learn about

¬ Difference methods for solving ordinary and partial differential equations.

¬ Ordinary Differential Equations: Methods for Initial Value problems, Stability and convergence analysis, Linear and nonlinear boundary value problems.

¬ Partial Differential Equations: Partial differential Equations of the first order-linear equation of the first order

¬ Linear partial equation with constand coefficient equation with variable coefficients.

¬ Elemetary solutions of laplaces equation-The wave equation

Course Outcome (COs)

¬ Solve Homogeneous equations, find solutions of exact equations, use the method of reduction of order to find a second linearly independent solution of a second order, linear homogeneous equation when one solution is given.

¬ Use the method of undetermined coefficients to solve second order, linear homogeneous equations with constant coefficients, Use the method of variation of parameters to find particular solutions of second order, linear homogeneouse equations.

¬ Solve first order linear differential equations, find the solution of homogeneous linear systems of equations.

¬ Form a partial differential equations by eliminating the arbitrary constants and functions, find different types of solutions like complete integral, singular integral and general integral. Solve Lagrange's equation.4

¬ Solve partial differential equations using Charpit's method, classify partial differential equations to five special types.

MECHANIS - 7MMA2C4

Course Description:

Understand the basic concepts of Velocity, Acceleration and Motion of Particles in all planes. The concept of forces and impact of the particles. The concept of forces and impact of the particles. Topics include:

ϖ The Mechanical System.

ϖ Hamilton Principle.

ϖ Differential forms and Generation Functions.

Course Objectives

ϖ Acquired Knowledege on Virtual Work, Energy and Momentum.

ϖ Distingaish Hamilton's Principle and Hamilton's Equations.

ϖ To provide students with basic skills and knowledge of Mechanics.

Course Outcome (COs)

ϖ The learner will be able to Understand the Generalized coordinates, constraints.

ϖ Derivative of Langrange's Equation and slove the examples.

ϖ Understand the Special Transformation, Lagrange and Poisson Brackets.

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M.Sc., Mathematics Programme

Algebra II - 4MMA2C1

Course Objectives

The objective of this subject is to expose student to understand the importance of algebra to improve ability to think logically, analytically and abstractly.

- Vector space: elementary basic concepts, linear independence and basis, dual spaces.
- Learn about and work with subspaces, linear transformation, inner products and their uses.
- Learn to solve systems of linear equations and application problems requiring them.
- Work with matrices and determine if a given squre matrix is invertible.

Course Outcome (COs)

Upon completion of the course the student will be able to:

- Use the definition of vector space to determine of a given set of vectors is a vector space.
- Use linear transformations to prove that vector spaces are isomorphic.
- Solve the eigenvalues and corresponding eigenvectors for a linear transformation.
- Understand the concepts on skew symmetric, orthogonal matrix, eigenvalues, eigenvectors and workout problems related to it.
- Solve problems on root of polynomials equations transformation of equations.

ANALYSIS-II - 7MMA2C2

Course Objectives

ϖ Acquired Knowledge on Riemann-Stieltjes Integration and Differentiation.

ϖ To apply Integration of Vector Valued Functions, Rectifiable Curves.

ϖ Discussion of main problem Sequences and Series of Function. ϖ Uniform Convergence, Continuity Integration and Differentiation.

ϖ Power Series, Logarithmic and Trigonometric Functions.

ϖ Prove Convergence theorems on Measurable Functions.

Course Outcome (COs)

ϖ To know the Basic of Analysis.

ϖ To learn the different types of Sequences and Series of Functions, Equicontinuous Families of Functions.

ϖ Understand the Bounded, Convergences, Divergence Definetion.

ϖ Prove a theorem the Stone Weierstrass theorem, Convergence theorem on Measurable Functions.

ϖ Define Algebra of Sets, Measurable Space, Lebesgue Measure.

ϖ Distinguish Lebesgue Measurable Sets and non Measurable Sets.

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M.Sc., Mathematics Programme

Probability and statistics. - 4MMA2C3

Course Objectives

¬ The objective of this subject is to expose student to understand the importance of probability and statistical methods.

¬ Axiomatic definition, properties conditional probability, Independent events, Baye's theorem, Density function, Distribution function, Expectation, Moments, Moment generating function, Characteristic function, Chebyshev's inequality, Law of large numbers.

¬ Special distributions: Binomial, Negative Binomial, Geometric, Poisson, Uniform, Normal, Gamma,Exponential, Joint distributions, Marginal and conditional density functions.

¬ Sampling theory for small and large samples, Sampling distributions, Estimation theory and interval estimation for population parameters using normal, t, F and Chi square distributions.

¬ Testing of hypothesis and test of significance.

Course Outcome (COs)

¬ Understand the concepts of Mechanics and its mathematical application by Newton's laws of

Applied Algebra - 7MMA2E1

Course Objectives

To provide the standard methods for solving applied algebra as well as method based on the use of NAND gates and NOR gates.

- Finite state machines, binary devices and states, Turing machines.
- Programminglanguages , FOR statements, The ALGOL grammer.
- Boolean algebras, disjunctive normal form.
- Optimization and computer design, logic design, sequential mechine design.
- Binary group codes, encoding and decoding, group codes.

Course Outcome (COs)

- Knowledge of various techniques of applied algebra and ability of solving certain type of practical problems.
- Use the applied algebra techniques that are best suited to solve certain problems. • Acquiring knowledge of the various techniques of applied algebra and training in solving practical problems using this techniques.

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Tiruppattur – 630 211.

M.Sc., Mathematics Programme

GRAPH THEORY - 7MMA2E2

Course Description:

The course covers basic theory and applications of combinatory and graph theory. Combinatorics is a study of different enumeration techniques of finite but large sets. Topics that will be studied include principle of inclusion and exclusion, generating functions and methods to solve difference equations. Graph theory is a study of graphs, trees and networks. Topics that will be discussed include Euler formula, Hamilton paths, planar graphs and coloring problem; the use of trees in sorting and prefix codes; useful algorithms on networks such as shortest path algorithm, minimal spanning tree algorithm and min-flow max-cut algorithm. Course Objectives: The successful student will know the definitions of relevant vocabulary from graph theory and combinatory, and know the statements and proofs of many of the important theorems in the subject, and be able to perform related calculations.

Course Objectives

The successful student will know the definitions of relevant vocabulary from graph theory and combinatorics, and know the statements and proofs of many of the important theorems in the subject, and be able to perform related calculations. Goals of the Course:

- gain an understanding of the fundamental concepts of graph theory,
- gain an understanding of when a graph is a useful mathematical tool to solve problems in mathematics, the sciences and the environment,
- develop the ability to write a logical and coherent proof, including proof by contradiction and induction,
- introduce topics suitable for a senior thesis (and see ones that have been),
- develop a desire for further study in related areas, including combinatorics and computer science.

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M.Sc., Mathematics Programme

Latex - 74MMA2E3

Course Objectives

This course intended to expose you to the basic ideas of Modern Analysis. In particular to learn about

- Understand the purpose and nature of LATEX user interface of LATEX.
- Understand how LATEX difference from a word processor.
- Format text in various way and learn how to use LATEX to format mathematical equations.

Course Outcome (COs)

After completion of coures, the students will be able to

- Explain and use TEX and LATEX.
- Describs the deelopement process of TEX and LATEX.
- Explaine the difference between TEX and LATEX.
- Tells the advantages of LATEX over other more traditional softwares.
- Wribe documents containing mathematical formulas.
- Type equations and formulas.
- Type mathematical symbols in prographs.
- Labels and refer the equations.

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M.Sc., Mathematics Programme

Course Description:

Discrete Mathematics - 7MMA2E4

Course Objectives

The objective of this subject is to expose student to understand the important discrete mathematical structure.

- Algebraic systems homomorphism and isomorphism of semi - groups and monoids, properties of homomorphisms.
- Logic, connectives, well -formed formulae, truth table of a formulae, replacement process, theory of inference, open statements, statements involving more than one quantifier.
- Lattices, new lattices, modular and distributive lattices.
- Boolean algebra, uniqueness of finite Boolean algebra, Boolean expression, Boolean polynomials, karnaugh map, switching circuits.

Course Outcome (COs)

- Solve the Boolean algebra for the two element Boolean algebra disjunctive normal form, conjunctive normal form of a Boolean expression.
- Use logical gates, construct and recognize truth tables for these gates and simple combinations of them with up to four inputs.
- Understanding the concept of TF statements, logic.
- Understand the definition of homomorphism, semi-groups, monoid, lattices, Boolean algebra.

Programming in Java- Theory and Practical- 7MMA2E5

Course Objectives

- Focus on object oriented concepts and jav programs structure and its installation, fundamentals user defined exceptions.
- Comprehension of java programming constructs control structure of java.
- Thread model, creating a thread, multiple threads, suspending, resuming, and stopping threads.
- Implementing object oriented constructs such as various class string handling, AWT classes, Event handling.
- Java networking, basics, TCP/IP sever sockets, URL, JAVA SCRIPTS, JDBC, EJB, JSP.

Course Outcome (COs)

- Create software application uing the java programming language.
- Dubug a software application written in the java programming.
- Test a software application written in the java programming language.
- Understanding of thread concepts an Input / Output in java.
- Understanding of various components of java AWT and swing and writtingcode snippets using them.

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M.Sc., Mathematics Programme

FLUID DYNAMICS -7MMA2E6

Course Objectives

The objective of this subject is to expose student to understand the importance of fluid dynamics in Science & Engineering.

¬ Kinematicsof fluids in motion: Real fluids and ideal fluids, Velocity of a fluid at a point , Stream linesand path lines, Steady and unsteady flows, The velocity potential, The velocity vector, Local andparticle rates of change, Equation of continuity, Acceleration of fluid , Conditions at a rigid boundary

. ¬ Equations of motion of fluid: Euler's equations of motion, Bernoulli's equation,Some flowsinvolving axial symmetry, Some special two-dimensional flows.

¬ Some three dimensional flows: Introduction, Sources, sinks and doublets, Axisymmetric flows,Stokes' stream function. The MilneThomson circle theorem, Theorem of Blasius.

¬ Viscous flows: Stress analysis in fluid motion, Relations between stress and rate of strain, Coefficientof viscocity and laminar flow, Navier-Stokes' equations of motion of viscous fluid, Steady motionbetween parallel planes and through tube of uniform cross section.Flow between concentric rotatingcylinders.

¬ Steady viscous flow in tube having uniform elliptic cross section, Tube having equilateral triangularcross section, Steady flow past a fixed sphere.

Course Outcome (COs)

¬ Understand the basic concepts of velocity, Acceleration and motion of particlesin all planes.

¬ Acquired adequate knowledge on Work, Energy and Simple Harmonic Mean.They can able to solve problems on that.

¬ Understood the concept of forces and impact of the particles.

¬ Acquired knowledge on conical pendulum, central orbits and general orbits.

¬ Acquired knowledge on Moment of Inertia of various shapes.

COMPLEX ANALYSIS - 7MMA3C1

Course Objectives

To introduce Elementary Theory of Power Series.

ϖ To equip with necessary knowledge and skills to enable them handle Mathematical Operations, Analysis and problems involving Complex Number.

ϖ Know and Understand Analytic Function and Local properties of Analytic Function.

Course Outcome (COs)

ϖ The learner will be able to comprehend the local and global properties of Analytic Functions.

ϖ Improve and outline the complex integration.

ϖ Prove a Cauchy Integral Formula.

ϖ Understand local properties of Analytic Functions.

ϖ The learner will be able to solve the problems, Power series expansions, Jensen's Methods.

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Tiruppattur – 630 211.

M.Sc., Mathematics Programme

TOPOLOGY – I -7MMA3C2

Course Description:

This course will cover the topics contained in the five syllabus. Several additional topics will also be covered and the presentation will not necessarily follow the text. Attendance is required and the exams will be over the lectures and homework. The course topics include:

- Topological spaces.
- Continuous functions.
- Connected spaces and real line.
- The countability axioms and the separation axioms.

Course Objectives

The objectives of this subject is to expose student to understand several important concepts in Topology -I.

- To study the student will also being topological spaces and the order topology.
- Closed sets and the product topology of components.
- Explain compact spaces and the compact sets in the real line.
- Components and path components and linit point compactness.
- The contability axioms and the separation axioms urtsohn's lemma.

Course Outcome (COs)

To understand Topological spaces and basic of a topology and the product topology.

- Identify the concept of connected sets in the real line components and path components.
- Understand the countability axioms and the separation axioms.
- Understand Urysohn's lemma and Urysohn's metrization theorm.

Operation Research - 7MMA3C3

Course Objectives

The objectives of this subject is to expose student to understand the importance optimization techniques and the theory behind it.

- Network models, enumeration of cuts, maximal flow algorithm, linear programming formulation of maximal flow mode, CPM computations.
- Deterministic inventory models, EOQ models, no step model, setup model.
- Queuing system, Elements of a queuing model, pure birth, death model.
- Generalized poisson queuing model specialized poisson queues, single server model, multi - server model, mechine servicing model, pollaczek, khintchine(P-K) formula, other queuing models.

Course Outcome (COs)

- Explain the meaning of operation research know the various techniques of operations research.
- Use operations research to solve transportation problems during the allocation of trucks to the formulate operation research models to solve real life problem.
- Solve linear programming problem by using algebraic graphical method.
- Understand the concept of minimal spanning tree algorithm and maximal flow algorithm

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M.Sc., Mathematics Programme

NUMBER THEORY - 4MMA3C4

Course Objectives

ϖ To expose students to this beautiful theory. ϖ To understand what inspired this quote from Gauss.
ϖ To allow students to experience mathematics as a creative, empirical science.
ϖ Acquired Knowledage on Divisibility, Greatest Common Divisor, Prime Numbers.
ϖ Distinguish Dirichlet Inverse and the Mobiles Inverse.
ϖ Derive the Mangoldt Inversion.
ϖ Derivatives of Arithmetical Functions the Selberg Identity.
ϖ Euler's Summation Formula Some Elementary Asymptotic Formulas.
ϖ Definition and Basic properties of Congruences Residue Classes and complete Residue Systems Linear Congruences.

Course Outcome (COs)

ϖ The Series of reciprocals of the primes the Euclidean Algorithm – The Greatest Common Divisors of more than two numbers.
ϖ Definition of Mobius Function μ(n),Euler Function (n),Mangoldt Function (n),Liouville's Function λ(n) and Division Function $\sigma\alpha$(n).
ϖ Prove a theorem Mobiles Inverse.
ϖ Distinguish The Average Order of d(n) - The Average Order of the Division Function $\sigma\alpha$(n).
ϖ Applications to (n) and ∧ (n).
ϖ Definition and Basic properties of congruences Residue classes and complete residue systems linear congruences – reduced residue systems.
ϖ Prove a theorem the Eular – Fermat Theorem, Polynomial congruences modulo Lagrange's Theorem. ϖ Evaluation of $(-1\ )$ and $(2\ p\ )$.
ϖ Prove a Theorem Gauss's Lemma and The Quadratic Reciprocity law.

Combinatorial Mathematics - 7MMA3E1

Course Objectives

- The students should gain an understanding of fundamental concepts of combinatorial.
- Combinatorial deals with the existence of certain configurations in in structure and when it exists it counts the number of such configurations.
- In this course we deal with the generating function,The principle of inclusion and exclusion.
- Polya theory of counting and Block designs.

Course Outcome (COs)

After completing this course, the student will be able to:

- Understand the rules of sum and product of permutations and combinations.
- Identify solutions by the technique of generating functions and recurrence relations with two indices.
- Understand the concepts of permutations with restrictions on relative positions and rook polynomials.

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Tiruppattur – 630 211.

M.Sc., Mathematics Programme

Stochastic Processes. - 7MMA3E2

Course Objectives

¬ This course is intended to expose you to the basic ideas of stochastic process.In particular to learn about.

¬ Stochastic processes and their applications.

Course Outcome (COs)

¬ The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described. Consult Appendix A.

¬ Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area.

¬ Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B.

¬ Guidelines for writing Learning Outcomes.

Fuzzy Mathema tics - 7MMA3E3

Course Objectives

The objectivesof this course are to:

¬ Provide an understanding of the basic mathematical elements of the theory of fuzzy sets.

¬ Provide an emphasis on the differences and similarities between fuzzy sets and classical sets theories.

¬ Cover fuzzy logic inference with emphasis on their use in the design of intelligent or humanistic systems.

¬ Provide a brief introduction to fuzzy arithmetic concepts.

¬ Provide an insight into fuzzy inference applications in the area of control and robotics.

Course Outcome (COs)

¬ Be able to distinguish between the crisp set and fuzzy set concepts through the learned differences between the crisp set characteristic function and the fuzzy set membership function.13

¬ Be able to draw a parallelism between crisp set operations and fuzzy set operations through the use of characteristic and membership functions respectively.

¬ Be able to define fuzzy sets using linguistic words and represent these sets by membership functions.

¬ Know how to perform mapping of fuzzy sets by a function and also use the α-level sets in such instances.

¬ Know fuzzy-set-related notions; such as α-level sets, convexity, normality, support, etc.

¬ Know the concept of a fuzzy number and how it is defined.

¬ Become familiar with the extension principle, its compatibility with the α-level sets and the usefulness of the principle in performing fuzzy number arithmetic operations (Additions, multiplications, etc.).

ARUMUGAM PILLAI SEETHAI AMMAL COLLEGE

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M.Sc., Mathematics Programme

FUNCTIONAL ANALYSIS - 7MMA4C1

Course Objectives

ϖ The objectives of the course are the study of the main properties of bounded operators between Banach and Hilbert Spaces.

ϖ The basic result associated to different type of convergences in normed spaces and the spectral theorem and some of its applications.

Course Outcome (COs)

On completion of this course the learner will

ϖ Be able to Normed Space and Continuity of Linear Maps.

ϖ Uniform Boundedness Principle.

ϖ Closed Graph and Open Mapping Theorems.

ϖ Duals of LP ([a,b,]) and c([a,b]).

ϖ Orthonormal Sets, Projection and Reisz Representation Theorems.

Topology – II - 7MMA4C2

Course Description:

Course Objectives

The objectives of this subject is to expose student to understand several important concepts in Topology - II.

- Connectedness and compactness: the Tychonoff Theorm.
- Use results from completely regular spaces , definition of a local finiteness.
- Explain from Nagata- smirnov metrization theorem.
- The compact open topology Ascoli's theorem .
- Complete metric spaces and functions of a space filling curve and nowhere differential functions.

Course Outcome (COs)

Students will be able to:

- Use local compactness and the tychonoff theorem describe the completely regular spaces.
- Explain the Nagata semirnov theorem for necessary and sufficient .
- Give the definition of concepts related to complete metric space.
- Understand the Metrization theorems and parcompactness.
- Understand the open topology and Baire spaces.
- To use A nowhere differential functions.

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NUMERICAL ANALYSIS - 7MMA4C3

Course Objectives

ϖ To introduce students to the technique of Numerical Analysis in systems of equations and unconstrained optimization.

ϖ To provide students with basic skills and knowledge of Numerical Analysis and its applications in mineral industry.

ϖ To introduce students topractical application of Numerical Analysis in big mining projects.

ϖ To solving the problem Relaxation Method Numerical Integration, Shooting Methods

Course Outcome (COs)

ϖ The learner will be able to optimization and steepest descentNewton's Method.

ϖ Solved the problems of Numerical Integration, Gaussian Rules, Numerical Integration by Taylor's Series.

ϖ Understand the Multistep formula, Corrector Methods, Finite Difference Methods, Shooting Methods.

Advanced Statistics - 7MMA4E1

Course Objectives

The course is designed to introduce more advanced statistical methods that are used in data analysis. both statistical theories and inference technique will be covered.

- Introduction to statistical inference, test of statistical hypothesis.
- Sufficient statistics, measures of quality of estimators, functions of a parameter
- More about estimation, fisher information and the rao.
- Theory of statistical tests, likelihood ratio tests.
- Inferences about normal models, a test of independence.

Course Outcome (COs)

On successful completion of this module, a student will be expected to be able to:

- Be competent on a variety of well- known distributions and the calculation involved.
- Understand the theories of statistical inferences and apply the approximate models in different setting to solve real life problems.
- Perform test of hypothesis as well as calculate confidence interval for single sample and two sample cases.
- Understand the concepts non-central chi-square and non-central F.
- Understand both the meaning and applicability of a dummy variable and the assumptions which underline a regression model.
- Understand the empty advanced statistical methods such as the analysis of variances , ratio test, the sequential probability ratio test.

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M.Sc., Mathematics Programme

Automata theory- 7MMA4E3

Course Objectives

¬ The fundamental topics to be covered in this course include regular expressions, finite automata, (non)regular languages, context-free grammars, regular grammars, Chomsky normal forms, pushdown automata, (non-)context-free languages, parsing and Turing machines.

¬ These fundamentals are essential prerequisite for those who may pursue more advanced topics and applications of Computer Science. Since the ultimate goal of automata theory is the construction of efficient program languages, no study of automata is complete without some experience designing grammars.

¬ For this purpose, a medium-scale program language design project will be assigned as a class project.

¬ The design project is an essential part of the successful course completion. The grading will be based on the following criteria.

Course Outcome (COs)

¬ Understand the concept of formal languages through such mechanism as regular expression, recursive definitions, finite automata, transition graph, Mealy machine and Moore machine.

¬ Apply Kleene's theorem and pumping lemma for the design and management of regular and non-regular languages.

¬ Construct context free, regular, Chomsky normal form grammars to design computer languages

¬ Design and construct a pushdown automata and a Turing machine for a computer language.